CLAIMS

We claim:

1. An isolated polynucleotide encoding a ligand-binding receptor polypeptide, said polypeptide comprising a sequence of amino acids selected from the group consisting of:

(a) residues 141 to 337 of SEQ ID NO:2;

(b) allelic variants of (a); and

(c) sequences that are at least 80% identical to (a) or (b).

2. An isolated polypeptide according to claim 1 comprising residues 141 to 337 of SEQ ID NO:2 or SEQ ID NO:4.

3. An isolated polynucleotide according to claim 1 wherein said polypeptide further comprises a transmembrane domain.

4. An isolated polynucleotide according to claim 3 wherein said transmembrane domain comprises residues 340 to 363 of SEQ ID NO:2, or an allelic variant thereof.

5. An isolated polynucleotide according to claim 3 wherein said polypeptide further comprises an intracellular domain.

6. An isolated polynucleotide according to claim 5 wherein said intracellular domain comprises residues 365 to 380 of SEQ ID NO:2, or an allelic variant thereof.

7. An isolated polynucleotide according to claim 1 wherein said polypeptide comprises residues 25 to 337 of SEQ ID NO:2 or SEQ ID NO:4.

8. An isolated polynucleotide according to claim 1 wherein said polypeptide comprises residues 1 to 380 of SEQ ID NO:2 or SEQ ID NO:4.

9. An isolated polynucleotide according to claim 1 which is a DNA as shown in SEQ ID NO:1 from nucleotide 49 to nucleotide 1188 or SEQ ID NO:3 from nucleotide 10 to nucleotide 1149.

10. An isolated polynucleotide according to claim 1 wherein said polypeptide further comprises an affinity tag.

11. An isolated polynucleotide according to claim 10 wherein said affinity tag is polyhistidine, protein A, glutathione S transferase, substance P, or an immunoglobulin heavy chain constant region.

12. An isolated polynucleotide according to claim 1 wherein said polynucleotide is DNA.

13. An expression vector comprising the following operably linked elements:

a transcription promoter;

a DNA segment encoding a secretory peptide and a ligand-binding receptor polypeptide, said polypeptide comprising a sequence of amino acids selected from the group consisting of:

(a) residues 141 to 337 of SEQ ID NO:2;

(b) allelic variants of (a); and

(c) sequences that are at least 80% identical to (a) or (b); and

a transcription terminator.

14. An expression vector according to claim 13 wherein said polypeptide comprises residues 141 to 337 of SEQ ID NO:2 or SEQ ID NO:4.

15. An expression vector according to claim 13 wherein said polypeptide further comprises a transmembrane domain.

16. An expression vector according to claim 15 wherein said transmembrane domain comprises residues 340 to 363 of SEQ ID NO:2, or an allelic variant thereof.

17. An expression vector according to claim 15 wherein said polypeptide further comprises an intracellular domain.

18. An expression vector according to claim 17 wherein said intracellular domain comprises residues 364 to 380 of SEQ ID NO:2, or an allelic variant thereof.

19. An expression vector according to claim 13 wherein said polypeptide comprises residues 25 to 337 of SEQ ID NO:2 or SEQ ID NO:4.

20. An expression vector according to claim 13 wherein said polypeptide comprises residues 1 to 380 of SEQ ID NO:2 or SEQ ID NO:4.

21. An expression vector comprising the following operably linked elements:

(a) a transcription promoter;

(b) a DNA segment encoding a secretory peptide and a chimeric polypeptide, wherein said chimeric polypeptide consists essentially of a first portion and a second portion joined by a peptide bond, said first portion consisting essentially of a ligand binding domain of a receptor polypeptide selected from the group consisting of:

(i) a receptor polypeptide as shown in SEQ ID NO:2;

(ii) allelic variants of SEQ ID NO:2; and

(iii) receptor polypeptides that are at least 80% identical to (i) or (ii),
and said second portion consisting essentially of an affinity tag; and

(c) a transcription terminator.

22. An expression vector according to claim 21 wherein said affinity tag is an immunoglobulin F_C polypeptide.

23. A cultured eukaryotic cell into which has been introduced an expression vector according to claim 13, wherein said cell expresses a receptor polypeptide encoded by the DNA segment.

24. A cell according to claim 23 wherein said cell further expresses a hematopoietic receptor β_C subunit.

25. A cell according to claim 23 wherein said cell is dependent upon an exogenously supplied hematopoietic growth factor for proliferation.

26. An isolated polypeptide comprising a segment selected from the group consisting of:

(a) residues 141 to 337 of SEQ ID NO:2;

(b) allelic variants of (a); and

(c) sequences that are at least 80% identical to (a) or (b),
wherein said polypeptide is substantially free of transmembrane and intracellular domains ordinarily associated with hematopoietic receptors.

27. A polypeptide according to claim 26 further comprising an immunoglobulin F_C polypeptide.

28. A polypeptide according to claim 26 further comprising an affinity tag.

29. A polypeptide according to claim 28 wherein said affinity tag is polyhistidine, protein A, glutathione S transferase, substance P, or an immunoglobulin heavy chain constant region.

30. A polypeptide according to claim 26 that is immobilized on a solid support.

31. A chimeric polypeptide consisting essentially of a first portion and a second portion joined by a peptide bond, said first portion consisting essentially of a ligand binding domain of a receptor polypeptide selected from the group consisting of:

(a) a receptor polypeptide as shown in SEQ ID NO:2;

(b) allelic variants of SEQ ID NO:2; and

(c) receptor polypeptides that are at least 80% identical to (a) or (b),

and said second portion consisting essentially of an affinity tag.

32. A polypeptide according to claim 31 wherein said affinity tag is an immunoglobulin F_C polypeptide.

33. A method for detecting a ligand within a test sample, comprising contacting a test sample with a polypeptide comprising a segment selected from the group consisting of:

(a) residues 141 to 337 of SEQ ID NO:2;

(b) allelic variants of (a); and

(c) sequences that are at least 80% identical to (a) or (b),

and detecting binding of said polypeptide to ligand in the sample.

34. A method according to claim 33 wherein said polypeptide comprises residues 25 to 337 of SEQ ID NO:2 or an allelic variant of SEQ ID NO:2.

35. A method according to claim 33 wherein said polypeptide further comprises transmembrane and intracellular domains.

36. A method according to claim 35 wherein said polypeptide is membrane bound within a cultured cell, and said detecting step comprises measuring a biological response in said cultured cell.

37. A method according to claim 36 wherein said biological response is cell proliferation or activation of transcription of a reporter gene.

38. A method according to claim 33 wherein said polypeptide is immobilized on a solid support.

39. An antibody that specifically binds to a polypeptide of claim 26.